CLAIMS

1. A method of treating an exhaust gas of a lean-burn reciprocating engine containing NO_x, which method comprising sorbing said NO_x on at least one NO_x sorber (30) when the exhaust gas is lean, intermittently contacting the at least one NO_x sorber with an agent effective to convert NO_x to N_2 thereby to regenerate the at least one NO_x sorber and feeding effluent of said intermittent contacting step to the engine inlet (14).

2. A method according to claim 1, comprising simultaneously contacting the lean exhaust gas with at least two NO_x sorbers (30A, 30B) arranged in parallel and intermittently contacting fewer than all of the NO_x sorbers simultaneously with said agent.

3. A method according to claim 2, wherein the gas flow in the or each NO_x sorber being regenerated is less than in the or each NO_x sorber not being regenerated and substantially the whole of the effluent of the or each NO_x sorber(s) being regenerated is fed to the engine inlet.

4. A method according to claim 1, 2 or 3, wherein the agent is a non-selective reductant such as hydrocarbon (HC), CO or hydrogen.

5. A method according to claim 4, wherein the agent is engine fuel.

6. A method according to claim 1, 2 or 3, wherein the agent is a nitrogen hydride.

7. A method according to any preceding claim, comprising catalytic oxidation (22) of HC and CO to steam ($H_2O_{(g)}$), CO_2 and/or of NO to NO_2 upstream of the or each NO_x sorber.

8. A method according to claim 7, comprising particulate matter (PM) collection (24) between NO oxidation and NO_x sorption.

9. A lean-burn reciprocating engine (10) emitting exhaust gas containing NO_x and having a treatment system (19) comprising at least one NO_x sorber (30) for sorbing NO_x when the exhaust gas is lean, means (32) for intermittently contacting the at least one NO_x sorber with an agent effective to convert NO_x to N_2 thereby to regenerate the at least one NO_x sorber and means for feeding effluent of said contacting to the engine inlet (14).

10. An engine according to claim 9, comprising exhaust gas recirculation (EGR) means (28, 34, 16) for use in normal or occasional modes of operation, which EGR means optionally comprising a pump.

11. An engine according to claim 9 or 10, comprising at least two NO_x sorbers (30A, 30B) arranged in parallel, and means for selectively contacting fewer than all of the at least two NO_x sorbers with the agent.

12. An engine according to claim 11, comprising means for reducing the gas flow to the at least one NO_x sorber during regeneration of that at least one NO_x sorber relative to the at least one other NO_x sorber not being regenerated and means for feeding to the engine inlet (14) substantially the whole of the effluent of the or each NO_x sorber being regenerated.

13. An engine according to claim 9, 10, 11 or 12, wherein the or each NO_x sorber (30) is associated with injector means (32A, 32B) for introducing the agent to gas at the inlet of the or each NO_x sorber (30A, 30B) during regeneration.

14. An engine according to any of claims 9 to 13, comprising a supply of agent.

15. An engine according to claim 14, wherein the agent is a non-selective reductant such as hydrocarbon (HC), CO or hydrogen.

16. An engine according to claim 15, wherein the agent is engine fuel.

17. An engine according to claim 13, comprising a common-rail fuel injection (12) system with a branch to the or each NO_x sorber injectors (30A, 30B).

18. An engine according to claim 14, wherein the agent is a nitrogen hydride.

19. An engine according to any of claims 9 to 18, comprising means, in use, for controlling the intermittent regeneration of at least one NO_x sorber (30) and the feeding of the effluent of the or each NO_x sorber regeneration to the engine inlet (14), thereby to reduce the amount of regeneration agent released into the atmosphere relative to a similar engine lacking the means for feeding NO_x sorber regeneration effluent to the engine inlet.

20. An engine according to any of claims 9 to 19, wherein the system comprises an oxidation catalyst (22) disposed upstream of the or each NO_x sorber (30) for catalysing the oxidation of HC and CO to steam and CO_2 and/or of NO to NO_2.

21. An engine according to claim 20, wherein the system comprises a particulate matter (PM) filter (24) located between a NO oxidation catalyst (20) and the or each NO_x sorber (30).